Anesthesia for Thoracic Surgery
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The goal of this rotation is for the resident to become familiar with the anesthetic management of the adult patient undergoing a variety of intrathoracic surgical procedures. Pre-operative, intra-operative, and postoperative management is emphasized including appropriate testing and preparation, intraoperative anesthetic management, and avoidance of postoperative complications emphasizing fluid management and pain control. Selected published papers on a CD-ROM are provided to the resident to supplement their practical clinical experiences in the operating room. At the completion of the rotation the resident should be able to interpret preoperative tests, be comfortable in providing one-lung ventilation by a variety of different techniques, and be expected to manage the adult patient having a thoracotomy, thoracoscopy or bronchoscopy.

- Basic Science Objectives – learn:
    - Lung anatomy
        - Normal
        - Pathologic
    - Causes of hypoxemia during one-lung ventilation
        - Wasted perfusion "shunt"
            - gravity
            - Hypoxic vasoconstrictive reflex
        - Cardiac output
        - Modes of ventilation
    - Management of hypoxemia during one-lung ventilation
        - Ventilator settings
        - Continuous positive airway pressure (CPAP)
        - Pharmacologic manipulation of the pulmonary circulation
- Clinical learning objectives.
    - Preoperative
        - History and physical examination of patient with chronic and acute lung diseases
        - Preoperative pulmonary function tests - interpretation
        - Read and understand chest radiograph and CT scans
            - Normal and abnormal anatomy
    - Intraoperative
    - Special Techniques
        - Invasive monitors
            - Arterial line
            - Central venous line
        - Epidural analgesia
            - Lumbar and thoracic route
        - Placement of double-lumen tube

- Clinical signs
- Flexible fiberoptic bronchoscopy
  - o Placement of bronchial blockers
    - Indications
      - Pediatric patients
      - Difficult airway and one-lung ventilation
- Surgical Procedures encountered. At the end of the rotation the resident is expected to know how to manage each of the following:
  - o Chest wall resections
    - Tumors
    - Pectus deformities
    - Eloesser flap
  - o Thoracotomy
    - Lobectomy, pneumonectomy
    - Esophagectomy (Ivor-Lewis, trans-hiatal)
    - Lung Volume Reduction Surgery (LVRS)
  - o Video-assisted Thoracoscopy
    - Lung, pleural, mediastinal biopsy and/or resection
    - Pleurodesis
    - Thoracentesis
    - LVRS
  - o Sternotomy
    - Thymectomy for myasthenia gravis
    - Resection anterior mediastinal tumors
  - o Whole lung lavage
    - Alveolar proteinosis
  - o Mediastinoscopy and Chamberlain Procedure
  - o Airway Stenting procedures
  - o Laser and PDT procedures
  - o Tracheal resection
  - o Bronchoscopy
    - Rigid
    - Flexible

- Topics discussed in the OR:
  - o What preoperative pulmonary function are appropriate for a specific operation - including spirometry, ventilation/perfusion scans and arterial blood gases
  - o How to read a chest radiograph and chest computed tomography scan
  - o What intraoperative monitors are routinely needed and which are appropriate for special procedures
  - o Anesthetic management of one-lung ventilation and causes and treatment of intraoperative hypoxemia

- Fluid management during lung resection – consequences of inappropriate management
- Lung volume reduction surgery – how it works
- Management of esophagectomy – different surgical approaches
- Advantages and disadvantages of double-lumen tube, Univent tube and bronchial blockers – which one to chose
- Hypoxic pulmonary vasoconstriction, gravity and other factors effecting intraoperative shunt
- Postthoracotomy pain management – what are the options
- Selective readings in thoracic anesthesia. Readings and discussion on specific operations which may not be performed during the month rotation to include the management of the patient with anterior mediastinal mass, whole lung lavage for alveolar proteinosis, airway stenting for the patient with intrathoracic and extrathoracic stenosis, anesthesia for the surgical management of emphysema (LVRS) and myasthenia gravis (thymectomy) and tracheal resection.